

The Fifteen Fundamental Properties of Wholeness

source: <http://www.tkwa.com/fifteen-properties/> adapted from Christopher Alexander



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1. Levels of Scale

Scale refers to how we perceive the size of an element or space relative to other forms around it. All things – a tea cup, a building, language, entire eco-systems – consist of smaller components. It is the relationship of the smaller elements which determines the character and degree of life of the whole.

Objects which contain a high degree of life tend to contain a beautiful range of scales within, which exist at a series of well-marked intervals and have clearly recognizable jumps between them. To have good levels of scale, it is extremely important that the jumps between different scales of centers not be too great or too small.



2. Strong Centers

The idea of a center is at the heart of all that creates life within an object. But rather than the traditional view of an isolated geometry in space, a true center is defined not only by its internal cohesion, but by its relation to context. A strong center can only occur when other centers are intensifying it.

Like levels of scale, the concept of strong centers is recursive. In something which is alive, a strong center is made of many other strong centers, at different levels, which in turn make us aware of the whole they compose.



3. Boundaries

The articulation of a form depends to a great degree on how its surfaces are defined and meet at edges. The effect of a strong boundary is twofold: First, it focuses attention on the center, further intensifying it; and second, the boundary unites the center which it surrounds with what is beyond.

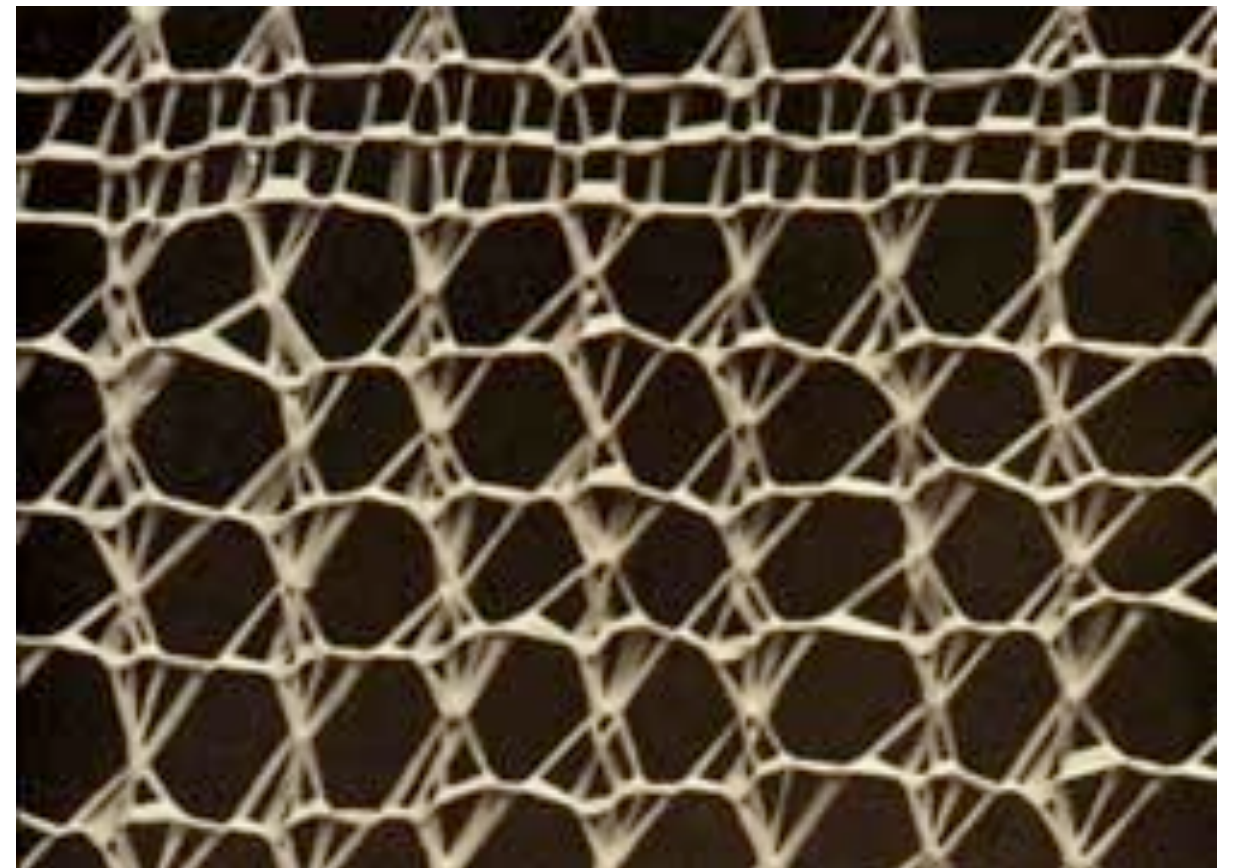
For the boundary to accomplish both of these tasks – to separate and to unite – it must have a degree of presence as strong as the center which it bounds.



4. Alternating Repetition

The principle of repetition orders recurring elements in a composition according to their proximity to one another, and by the visual characteristics they share. Elements need not be perfectly identical to be grouped in a repetitive fashion; they must merely share a common trait of size, shape, or detail characteristics allowing each element to be individually unique, yet belong to the same family.

When the repetition within a group of elements occurs parallel on a number of different levels, an alternating rhythm of centers forms, one series of centers intensifying the other.



5. Positive Space

Positive space refers to shaped space. Where an element occurs in space, the element not only exists with its own shape, but it also acts to define the shape of the space around it. For something to be whole, both the element itself and the space around it must engage one another, each intensifying the other. When this occurs, every single part of space has positive shape as a center – there are no amorphous, meaningless leftovers. Every shape should be a strong center in itself, which is in turn made up of other, smaller centers.



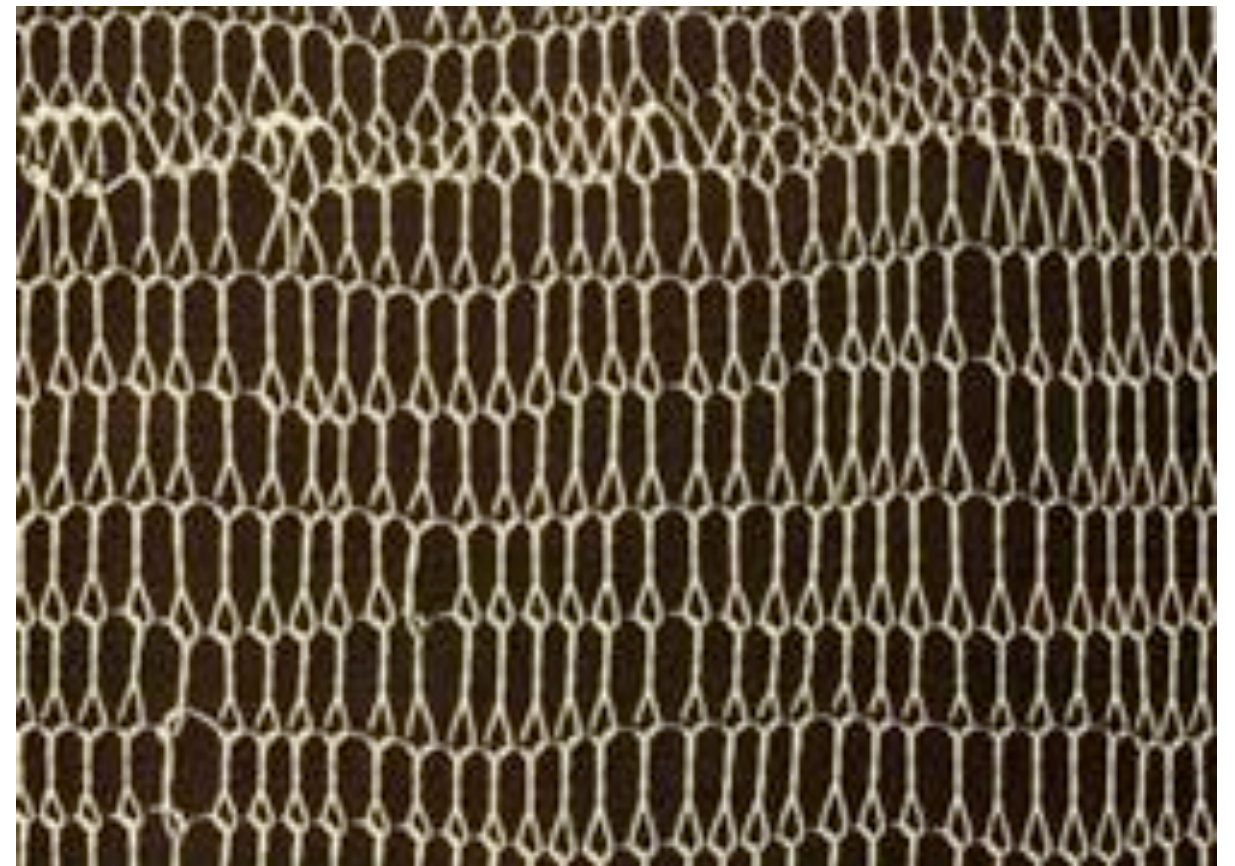
6. Good Shape

Shape is the principal identifying characteristic of form, resulting from the specific configuration of a form's surfaces and edges. Good shape happens when the surfaces and edges of a form have strong centers in every part of themselves. A good shape, even if complex, can usually be broken down easily into more simple shapes. A good shape tends to contain a high degree of internal symmetries, an overall bilateral symmetry, and a well-marked center. The good shape also creates positive space around it, is very strongly distinct from what surrounds it, and has a feeling of being closed and complete.



7. Local Symmetries

A symmetry, or the balanced distribution of equivalent forms or spaces about a common line or point, can organize elements in architecture in two ways: an entire organization can be made symmetrical, or a symmetrical condition can occur in only a portion of the building or object, at any scale. The latter case is what we refer to as local symmetry. Overall symmetry in an object tends to look mechanical and lifeless, usually due to the fact that local symmetries are absent within the overall form. However, when there are local symmetries, centers tend to form and strengthen the whole.



8. Deep Interlock

Forms which have a high degree of life tend to contain some type of interlock – a “hooking into” their surroundings – or an ambiguity between element and context, either case creating a zone belonging to both the form and to its surroundings, making it difficult to disentangle the two.

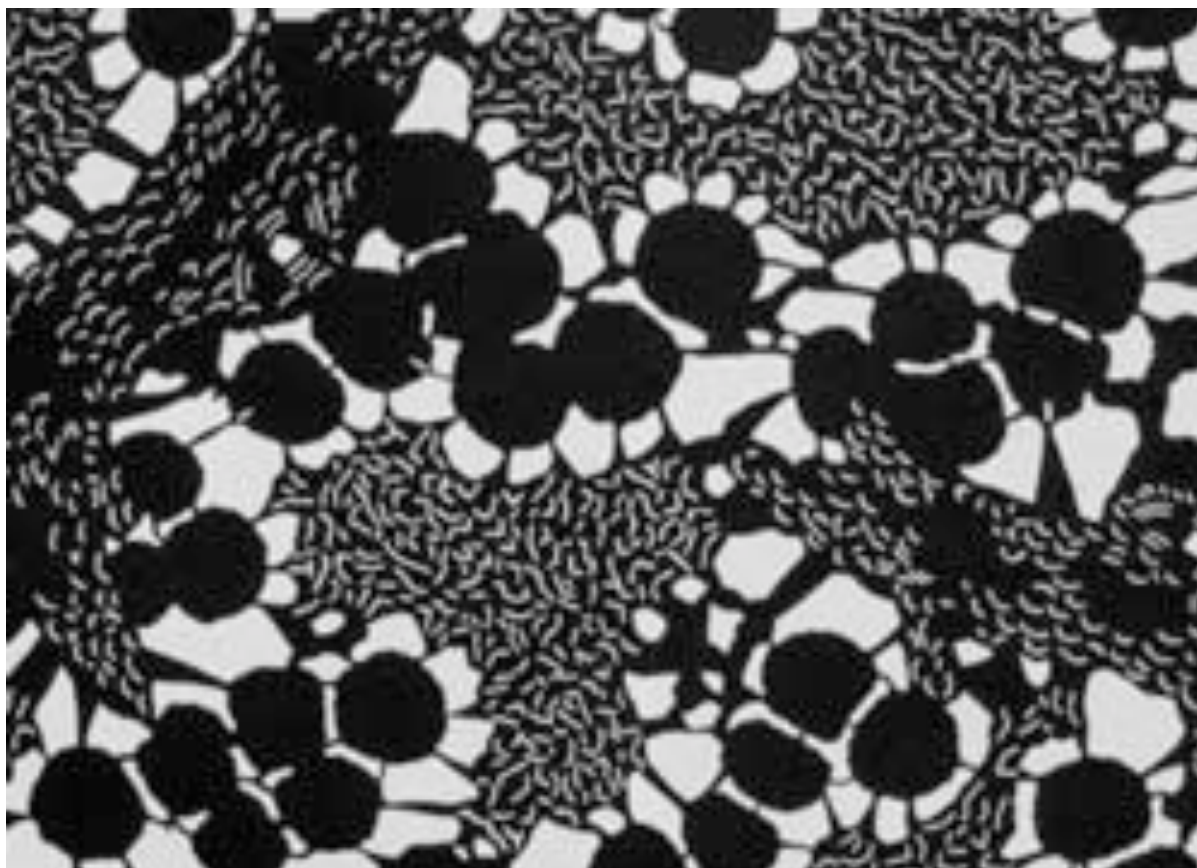
The interlock, or ambiguity, strengthens the centers on either side, which are intensified by the new center formed between the two.



9. Contrast

Works of art which have great life often have intense contrast within: rough/smooth, solid/void, loud/silent, empty/full. It is the difference between opposites which gives birth to something. Contrast is what often gives other principles their degree of life – the intensity of the boundary, the markedness of the alternating repetition.

Contrast strengthens centers by making each a deeper entity of itself, and thereby giving deeper meaning to both. It is, at its simplest, what allows us to differentiate. But meaningless contrast remains meaningless. It is only when centers are actively, mutually, and meaningfully composed that it acts to deepen the whole.



10. Graded Variation

Gradients must arise simply because in the natural world, things vary in size, spacing, intensity, and character. All living things tend to have a certain softness. One quality changes slowly, not suddenly, across space to become another. In something which has life, throughout the whole there are graded fields of variation, often moving from the center to the boundary or vice-versa. We are able to read the character of a larger center often because of the gradation of smaller centers across the larger form.



11. Roughness

Roughness is the odd shape, the quick brush stroke, the irregular column size or spacing, the change in pattern at the corner – it is adjusting to conditions as they present themselves with meaning, but without ego or contrived deliberation. Though it may look superficially flawed, especially with human perception accustomed to mass-produced regularity and perfection as a goal, an object with roughness is often more precise because it comes about from paying attention to what matters most, and letting go of what matters less.



12. Echoes

When echoes are present within a design, all the various smaller elements and centers, from which the larger centers are made, have a certain sameness of character. There are deep internal similarities, or echoes of one another, which tie all the elements and centers together at various scales to form a cohesive unity of being



13. The Void

Objects or elements which have the greatest depth, which actively draw the senses in, have at their heart an area of deep calm and stillness – a void bounded by and contrasted with an area of intense centers around it.

When an element becomes all detail, its own constant buzz tends to dilute its overall strength. Like a musical wall of sound, it pushes against our perception to produce a flat field-like state. Conversely, it is the pause which allows us to interlock with a piece of music and feel its depth. The presence of void, at many scales, provides a contrasting calm to alleviate the buzz and strengthen the center.



14. Inner Calm

Living things tend to have a special simplicity, an economy developed over time in which all things unnecessary, or not supporting the whole, are removed. This does not preclude ornament, as even in nature ornament has its very necessary place. What simplicity does is cut away the meaningless attachments to an element, the things which often distract and confuse its true nature. When this is done, an object is in a state of inner calm.



15. Not-Separateness

Not-separateness is the degree of connectedness an element has with all that is around it. A thing which has this quality feels completely at peace, because it is so deeply interconnected with its world. There is no abruptness, no sharpness, but often an incomplete edge which softens the hard boundary. The element is drawn into its setting, and the element draws its setting into itself.

Not-separateness is a profound connection occurring at many scales between a center and the other centers which surround it, so that they melt into one another and become inseparable.

